

**Before a Board of Inquiry  
Northern Corridor Improvements Project**

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Under the Resource Management Act 1991 ('the Act')

In the matter of a Board of Inquiry appointed under section 149J of the Act to consider notices of requirement for designations and resource consent applications by the New Zealand Transport Agency for the Northern Corridor Improvements Project

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**Statement of evidence of Campbell James McGregor for the New Zealand Transport Agency (Utilities)**

Dated 20 April 2017

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## STATEMENT OF EVIDENCE OF CAMPBELL JAMES MCGREGOR FOR THE NEW ZEALAND TRANSPORT AGENCY

### 1 Qualifications and experience

- 1.1 My full name is Campbell James McGregor.
- 1.2 I hold a Bachelor of Surveying from University of Otago, Master of Engineering Studies (Honours) and Post Graduate Diploma in Business from Auckland University. I am a Chartered Professional Engineer and a full member of the Institution of Professional Engineers New Zealand.
- 1.3 I have worked in New Zealand, Australia and the United Kingdom over the past 14 years within various engineering consultancies providing infrastructure planning and design advice for residential, commercial and industrial developments as well as large scale infrastructure projects. I currently lead Aurecon's Land Infrastructure team in Auckland.
- 1.4 Some examples of previous work I have conducted with regard to significant utility design and coordination are Canary Wharf Development in London, Qatar National Museum, Doha and more recently the City Rail Link for Auckland Transport where I was responsible for managing the utility and drainage designs and investigations. I have also previously provided evidence for Council Planning hearings and the Environment Court.
- 1.5 My evidence relates to notices of requirement and resource consent applications lodged by the New Zealand Transport Agency ('**Transport Agency**') with the Environmental Protection Authority on 14 December 2016 for the Northern Corridor Improvements Project ('**Project**').

### 2 Involvement with the Project

- 2.1 While I am familiar with the overall Northern Corridor Improvements scheme, I have focussed primarily on the impact the Project has on utility infrastructure. My role in the Project has been to lead the utility

consultation and design development for the purpose of the Board of Inquiry ('**BOI**') process.

- 2.2 I have also been responsible for leading the workstream associated with the relocation of the Harbour Hockey facility in order to provide space for the Northern Corridor Improvements Project. However, the focus of this evidence is on the Project's impacts on utilities.
- 2.3 I have read and contributed to relevant sections of the *Design and Constructability Report* (Technical Report) that formed part of the Assessment of Environmental Effects ('**AEE**') lodged in support of the Project. This Technical Report sets out the notable utilities which will be affected by the construction of the Project. I have been involved in consulting with the various utility stakeholders in the development of design solutions for the diversion or protection of utility assets described within the Technical Report.

### **3 Code of conduct**

- 3.1 I have read and am familiar with the Code of Conduct for Expert Witnesses in the current Environment Court Practice Note (2014), have complied with it in the preparation of this evidence, and will follow the Code when presenting evidence to the Board. I also confirm that the matters addressed in this statement of evidence are within my area of expertise, except where I rely on the opinion or evidence of other witnesses. I have not omitted to consider material facts known to me that might alter or detract from the opinions I express.

### **4 Scope of evidence**

- 4.1 This evidence addresses the following matters:
- a Existing utilities in the vicinity of the Project;
  - b Description of the utilities affected by the Project;
  - c Mitigation of effects on utilities;
  - d Comments on submissions lodged in relation to the Project;

- e Response to the section 149G(3) key issues report; and
- f Conclusions.

4.2 In preparing this evidence, I have reviewed the following evidence:

- a Mr Glucina, Transport Agency;
- b Mr Moore, Project Design;
- c Mr Hale, Construction;
- d Mr Schofield, Alternatives;
- e Mr Hughes, Stormwater;
- f Mr Burn, Planning (designations); and
- g Mr McGahan, Planning (resource consents).

## **5 Executive summary**

- 5.1 My evidence relates to existing utility infrastructure that is impacted by the proposed Project.
- 5.2 The existing environment is typical of a highway corridor consisting of both trunk and local utility service routes that have been installed in the verge of the existing corridor.
- 5.3 The Project's impact is greatest in those areas outside the existing corridor, which for this Project relates to the land required to form the SH1 to SH18 interchange.
- 5.4 As a result of the Project a number of utilities will be impacted and either require protection or diversion from their current location.
- 5.5 Consultation with utility stakeholders has been undertaken throughout the design development stage in leading up to lodgement of the Board of Inquiry document and is ongoing with key affected stakeholders.
- 5.6 A number of preliminary design solutions have been developed to mitigate the effects of the Project on existing or proposed future utility works.

These solutions have been developed in direct consultation with the affected asset owner.

- 5.7 In addition to these solutions suitable consent conditions have also been developed based on the consultation feedback from the affected parties and in response to the submissions received from Watercare Services Limited (**'Watercare'**), Vector Ltd (**'Vector'**) and Transpower New Zealand Limited (**'Transpower'**) on the Project.
- 5.8 I consider, based on the current design solutions and the proposed conditions, the effects of the Project on utility stakeholders' assets will be adequately mitigated.

## **6 Existing environment**

- 6.1 The existing environment is highly urbanised and contains many network utilities within and adjacent to the proposed alignment of the Project. Several utility operators have existing designations or land holdings that lie within the Project area, including Auckland Transport, Auckland Council, Watercare, Transpower and Vector.
- 6.2 Where Project works need to occur within the designations of other network utility operators, the Transport Agency will seek prior approval as required by the Resource Management Act (**'RMA'**).
- 6.3 The existing environment is typical for a highway corridor and consists of both trunk and local utility service routes relating to power and communications.
- 6.4 The area where the Project has the greatest impact on utilities is where significant widening of the road corridor and creation of new connections is required, in the vicinity of the State highway 18 (**'SH18'**) to State highway 1 (**'SH1'**) interchange. As identified within Section 4.10 of the *Design and Constructability Report*, Vector and Transpower both have transmission assets in this location. In addition, Watercare's Rosedale Waste Water Treatment Plant (**'RWWTP'**) is a large strategic infrastructure asset within the Project Area to which flows are conveyed through significant trunk pipe assets.

## 7 Effects on utilities

- 7.1 The Project will directly affect a variety of network utilities including stormwater, potable water supply, wastewater supply, power and gas distribution, power transmission lines, Transport Agency monitoring systems, Auckland Transport communications cables, and telecommunications.
- 7.2 Consultation with affected network utility operators has occurred throughout the design development stage and is on-going. Contractual minimum requirements have also been reviewed and agreed with individual stakeholders.
- 7.3 Meetings have generally been held with individual stakeholders in the collation of our design documentation. For ease of reference I have tabulated below the dates at which consultation has occurred up until lodgement of the NORs and resource consent applications with the various parties (excluding Auckland Council and Watercare which are addressed in paragraphs 7.4 and 7.5)

Stakeholder	Meetings (all dates are 2016)
Vector	7 April, 25 May, 13 July, 29 July, 1 August, 1 November, 1 December
Vodafone	12 August, 1 November
Chorus	16 November
Transpower	22 July, 9 November, 14 December

### *Auckland Council stormwater*

- 7.4 A number of Auckland Council stormwater assets are required to be modified or relocated in order to accommodate for the proposed alignment. These are discussed in the evidence of **Mr Hughes**.<sup>1</sup>

<sup>1</sup> Refer Mr Hughes' evidence in chief (Stormwater).

*Watercare assets*

- 7.5 The Project Team has been in regular consultation with Watercare, meeting fortnightly since June 2016, and continuing to hold these regular meetings to the current time.
- 7.6 The Transport Agency and Watercare will work co-operatively together for their various projects to co-ordinate the construction work proposed for the NCI Project, the East Coast Bays Sewer Link, the North Harbour 2 watermain and the proposed expansion of the RWWTP which is in the early planning stages.
- 7.7 The proposed alignment of the Project within the wastewater conveyance ponds at Watercare's facility in Rosedale will impact on the existing pond link which connects Pond 1 and Pond 2. Watercare has indicated its future expansion plans include the requirement to upgrade the existing capacity of the pond link. The motorway widening for the Project will occur in the same location as the pond link, and this allows the pond link capacity to be upgraded as part of the motorway widening. It is therefore proposed to provide an additional pipe connection between the ponds which will provide hydraulic connectivity equivalent to the capacity of the outfall structure from Pond 2. The existing operational pond link shall be retained to provide additional capacity but also provide a secondary connection that can be utilised for inspection and/or maintenance operations. The earthworks volumes for the Project have been calculated to include the earthworks necessary for the pond link upgrade so that the resource consents can authorise both activities.
- 7.8 The proposed alignment of SH18 will impact two existing sewer lines (Trunk Sewer 5 and Trunk Sewer 7) which will need to be diverted. The relocations of these sewers are major projects in themselves and will require significant temporary works to divert flows during construction. Again, this work has been incorporated into the Project programme and consents.
- 7.9 In addition, Watercare is currently seeking resource consent for the North Harbour 2 watermain, which is proposed to be installed adjacent to SH18 between William Pickering Drive and Albany Highway. The design of the

Project has taken this proposed watermain into consideration and, if this watermain design option is progressed, a suitable corridor could be allowed for beneath the new Shared Use Path ('SUP') which would then mean the installation of the watermain pipework would form part of the Project works. This corridor would allow the watermain project to proceed, and ensure the watermain can be accessed for maintenance purposes without disrupting State highway traffic.

- 7.10 The Transport Agency involved Watercare in discussions about options to mitigate effects on the Hockey Stadium. Watercare's future development plans and concerns to avoid reverse sensitivity effects were factored into the decision to relocate the Hockey Stadium to Rosedale West (rather than reorganise the facility on the current site or use any Watercare land).
- 7.11 Finally, the Project will affect Watercare's proposed East Coast Bays Link Sewer Project which is to provide a further link from East Coast Bays to the Rosedale Wastewater Treatment Plant therefore having to pass across the proposed NCI designation and SH1 corridor. The Transport Agency and Watercare have been working together to co-ordinate design and construction of the two projects, to ensure works are coordinated. All authorisations required under the RMA for the East Coast Bays Link Sewer are to be sought separately by Watercare.
- 7.12 Watercare's submission is generally in support of the Project, however it seeks conditions to address aspects of the proposal that relate to Watercare interests.
- 7.13 The Project Team has developed conditions pertaining to items under section 4 of Watercare's submission, where these are not already covered by proposed condition NU.1. These new conditions are attached to the evidence of **Mr Burn** and **Mr McGahan** and provide that:<sup>2</sup>
- a Reasonable vehicular access between Ponds 1 and 2 (under SH1) is to be maintained during construction of the NCI Project;

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<sup>2</sup> Refer Annexure A **Mr Burn's** evidence in chief and Annexure A **Mr McGahan's** evidence in chief.

- b Reasonable vehicular access around the southern edge of Pond 1 is to be maintained during construction of the NCI Project;
- c A vehicular access route along the western edge of Pond 2 or an alternative access arrangement is to be agreed with Watercare;
- d The existing boat ramp at Pond 2 will be relocated before the existing boat ramp is removed;
- e Watercare will be consulted during the preparation of the Urban Design and Landscape Plan, particularly in relation to:
  - i those areas of Watercare's designated land that are to be used for construction purposes only; and
  - ii long term mitigation to screen the Rosedale WWTP.
- f Security barriers will be constructed to prevent people accessing Watercare's site (in particular Pond 2) from the new shared use path;
- g Review of the final project designation footprint is required by the proposed designation conditions.
- h Sediment release into either Ponds 1 or 2 during the construction period will be managed in order to avoid non-compliance with the TSS or pathogen levels at the compliance measuring point (at the outlet of the UV plant at the eastern end of Pond 2) set by Watercare's discharge permit to Mairangi Bay (Permit No. 23799);
- i The continued operation of the existing Wairau Valley Branch Sewer (TS5) and East Coast Bays Branch Sewer (TS7) will be protected during the construction period. In particular, the TS7 pipe bridges will require engineering support and protection prior to any construction around the pipe bridges commencing;
- j The transmission sewer diversion for the Wairau Valley Branch Sewer (TS5) and the East Coast Bays Branch Sewer (TS7) must meet Watercare's Design and Construction standards; and

k Utility corridors will be provided within the areas of works to enable the future installation and maintenance of the new East Coast Bays Link Sewer being planned by Watercare.

7.14 I understand that the additional conditions provided in Mr Burn's evidence address the above matters and therefore will resolve all of Watercare's outstanding concerns with the Project.

*Vector assets*

7.15 The proposed State highway alignment and busway conflict with several existing Vector overhead and underground power lines in multiple locations throughout the Project area. Relocation works have been discussed and agreed to in principle with Vector.

7.16 No major relocation of Vector's gas assets has been identified as necessary to accommodate for the Project. A 50mm MP4<sup>3</sup> gas main on Paul Matthews Drive may require relocation and the Transport Agency intends to continue to communicate with Vector on this matter as the design progresses.

7.17 Vector's submission is neutral as to the Project, provided any decision on the Project recognises and provides for Vector's assets and incorporates methods to avoid or mitigate potential adverse effects on Vector's infrastructure.

7.18 The Transport Agency and Vector are working towards agreeing details relating to the protection or possible relocation of Vector's assets, including appropriate cost apportionment.

7.19 I consider that, with the proposed conditions and continued consultation with Vector, any potential effects can be avoided or mitigated.

*Transpower assets*

7.20 The proposed SH18 alignment and ramps will cross Transpower's 220kV NAA<sup>4</sup> underground transmission cables in two locations. The Project

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<sup>3</sup> MP4 – measure of gas pressure 210kPa – 420kPa

<sup>4</sup> North Auckland and Northland

design has avoided the need to relocate the existing cables by bridging them. This will allow the safe construction and operation of the Project. Nonetheless, the thermal and conductive properties of these cables will be impacted as a result of increased fill above the cables.

- 7.21 To mitigate potential adverse effects on the thermal and conductive properties of these cables, it is proposed that the road be bridged over the cables. The bridging is to include a culvert to provide for maintenance access along its full length as well as to enable the safe installation over the existing cable, while preserving the ability to install a possible second cable in the future. Transpower is currently undertaking further design work to further detail the design requirements of the State highway and culvert over these sections of cables. These requirements and design are to form part of the Transpower Solution Study Report which will inform the final design and works of the Project in these areas.
- 7.22 Transpower's submission partially opposes the Project and seeks to ensure that the Project is designed and suitable conditions and mitigation measures are put in place to ensure its assets are not compromised.
- 7.23 Since receiving Transpower's submission I have met with Transpower representatives to discuss suitable conditions to protect Transpower's assets. As a result of this, the Transport Agency has suggested the imposition of further resource consent conditions designed to:
- a ensure no works occur within Transpower's designation until such time as all relevant RMA approvals have been obtained;
  - b Ensure the NCI Project makes provision for a conduit that is sufficient to allow Transpower to install, operate and maintain two 220kV circuits;
  - c Ensure that an appropriate Electricity Infrastructure Management Plan (EIMP) is prepared in consultation with Transpower and submitted to Council and certified prior to the commencement of works within Transpower designation. The EIMP shall include methods and measures to ensure the NCI protects and provides for Transpower's two 220kV circuits along the same general alignment.

- 7.24 The additional conditions proposed are attached to the evidence of **Mr McGahan**.<sup>5</sup>

*Telecommunication assets*

- 7.25 The fibre backbone which currently runs adjacent to SH1 is to be impacted by the proposed widening of the SH1 corridor and busway extension works. The Project will therefore require the relocation of this backbone. The backbone includes Vodafone and Vector communications as well as the Transport Agency's Intelligent Transport Systems ('ITS') and Advanced Traffic Management Systems ('ATMS') communications infrastructure.
- 7.26 Alternatives for the relocation of the fibre backbone have been considered – namely, leaving the cables in their current location, relocating them in part along the alignment, or relocating the cables along the full length of the Project area to either the SUP or the motorway verge between the proposed motorway and busway. If the backbone were to remain in its current location, the works required for the jointing of the fibre will be timely and costly. In my opinion the most appropriate mitigation measure is to relocate the full length of the backbone between the Oteha Valley southbound on ramp and Constellation Drive beneath the proposed SUP along SH1. Consultation with the affected parties Vodafone, Transport Agency ITS/ATMS and Vector has confirmed the proposed mitigation measures are appropriate.

*Alternatives considered*

- 7.27 The effect on utilities both during construction and operation once the final Project is complete is significant, and it is therefore critical to consider all activities in the development of appropriate design mitigation solutions. In my opinion this has been achieved through the consultation undertaken with all relevant utility stakeholders and the development of the mitigation measures all of which have been reviewed and agreed in principle through the consultation and design development process discussed at paragraph 7.3 of my evidence.

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<sup>5</sup> Refer Annexure A **Mr McGahan's** evidence in chief.

7.28 As the Project is primarily a widening project, and generally utilities are located in the verge or berm along the edge of the motorway corridor, it was not feasible to avoid existing utilities. Therefore, appropriate mitigation measures have been developed in consultation with the relevant utility operators to ensure an acceptable outcome to all asset owners, including the Transport Agency.

## **8 Mitigation of effects**

8.1 Consultation has occurred with the affected network utility operators through regular meetings but also through documentation of all the impacted utilities and agreement on proposed mitigation measures. I have been present at most of these meetings.

8.2 Section 7 of my evidence describes mitigation measures agreed with Watercare, Transpower and operators of the fibre backbone, including additional proposed conditions.

8.3 In addition, Condition NU.1 is proposed to ensure that the safe and efficient operation of network utilities is not compromised by the Project. The scope and timing of any relocation or protection works for utilities are to be developed and agreed between the Transport Agency and the network utility provider.

8.4 In my opinion the proposed mitigation and resolutions proposed are appropriate to mitigate the Project's adverse effects on the assets of network utility providers.

## **9 Response to submissions**

9.1 Four submissions were received in relation to utilities. These submissions are from Transpower, Vector, Watercare and Auckland Council.

9.2 Auckland Council's submission in terms of utility infrastructure only raises matters relating to stormwater and flooding which are addressed within the evidence of **Mr Hughes**.<sup>6</sup>

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<sup>6</sup> Refer section 13 of Mr Hughes' evidence in chief (Stormwater).

9.3 I have read the three other submissions (from Transpower, Vector and Watercare and have discussed these in my evidence above.

## **10 Response to section 149G(3) key issues report**

10.1 Paragraph 171 of the Key Issues Report states that a key issue is the extent to which effects on other infrastructure are avoided, remedied and mitigated in a way that allows those infrastructure services to continue in a safe and efficient way.

10.2 As discussed throughout my evidence, I consider the Project has been developed to avoid, to the extent practicable, impacts on other infrastructure in the Project area. For example, the Project has been designed to avoid the need to relocate Transpower's underground cable and to avoid impacts on the operation of Watercare's RWWTP but also consider Watercare's future expansion plans for the plant.

10.3 Where infrastructure will be affected, consultation has ensured those effects are well understood, and can be effectively remedied and mitigated. I consider the Project will allow affected infrastructure services to continue in a safe and efficient way. Proposed condition NU.1 requires this to occur.



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**Campbell James McGregor**

20 April 2017